Mapping of The Kota Tua Madiun for Digital Urban Tourism

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Abstract. The city of Madiun is one of the areas in East Java Province with many historical heritage buildings from the Colonial Era. This historical heritage has the potential to become a center for historical tourism and introduce social culture in the Kota Tua Madiun. So that this can create new job opportunities that can be utilized by the local community to improve the economy of Madiun City. However, the change of era that continues to develop makes historical heritage less well known in the midst of a city that continues to grow. So it is necessary to do research that aims to promote and develop cultural tourism in Madiun City through interactive digital maps with Augmented Reality (AR) technology. This research uses the library research method regarding digital tourism, which has the potential to develop tourism in the Kota Tua Madiun. The use of AR in mapping the Kota Tua area aims to make it easier for visitors and the public to get to know historical heritage in this digitalization era and as an interesting educational tool for tourists to get to know various cultures and historical heritage in the Kota Tua Madiun area. Thus, the development of tourism in the City of Madiun can create new jobs for the local community, thereby increasing community and regional income.

Keywords: Madiun, Tourism, Augmented Reality

1. Intoduction

The era is developing rapidly as time changes, causing the tourism sector to be demanded more in terms of intensifying complete information and the provided tourism infrastructure has standardized facilities to attract domestic and foreign tourists so that it has its own uniqueness that tourism in other regions does not have. Tourism development must be balanced with creative industries to encourage regional economic growth and attract domestic and foreign tourists. The potential for regional tourism development can be developed even more modernly without having to leave the culture and history of a developed area. Human resource development must also be taken into account to increase the capacity of community resources with business opportunities in the tourism sector and increase public awareness as cultural actors. Using historical buildings as tourism products is one of the solutions to maintaining and preserving this historical heritage so that it is sustainable in the era of modernization. The use of historic buildings as tourist destinations presents a huge challenge because, in addition to having an economic impact on the community, conservation actions are required in collaboration with the government and the community to maintain their sustainability [1].

The rapid development of digital technology, along with the development of the times, has caused the use of information and communication technology to be inseparable from how social society can interact. Thus, people know more about what is happening out there than what is happening in their surroundings. Technology plays an important role in the dynamics of modern life, including how to introduce historical heritage into an environment. Now people are very dependent on the existence of technological facilities such as gadgets as the communication medium that is most often used. Increasing people's dependence on developing technologies, such as augmented reality (AR), which can create immersive and interactive experiences through the integration of virtual elements into the real world so that they can see and interact with additional relevant information in the actual context. This can increase user understanding, engagement, and satisfaction in a variety of situations. In addition, the use of AR can provide great benefits for its users, including increasing efficiency and productivity in various fields, producing more interesting and effective education by presenting subject matter visually and interactively, and enhancing the tourism experience by presenting additional information and context of interest to visitors. By using AR devices, visitors can see tourist objects in historical context and 3D visualizations that appear at tourist sites.

Augmented reality (AR) is a digital technology that combines real-world objects with interactive virtual-world objects in real-time [2]. The use of augmented reality (AR) has spread to various aspects of life because it has a charm that makes it easier for users to carry out an activity, for example, as an educational strategy or as a promotion of cultural tourism to introduce social culture in an area. The progress of cultural tourism can have an impact on reducing unemployment and poverty because the development of cultural tourism can create jobs and increase the welfare of the local community. The use of conventional print media in this era of digitalization is felt to be less effective in developing the tourism sector, because public interest is decreasing with the use of promotional books that are considered ordinary and less attractive. In addition, the distribution of promotions using conventional media is uneven, which can cause the information conveyed to target consumers indirectly. This causes spending on promotion costs to be greater and tourism to not develop.

The wealth of regional resources, both physically, environmentally, and socially, is an interesting object in itself for a more in-depth study of tourism with an AR or Augmented Reality technology approach. This approach is carried out in an effort to facilitate and optimize human resources and natural resources so that they can be utilized as best as possible to improve people's welfare while maintaining environmental conditions in a sustainable manner amid the development of the digitization era.

Indonesia has many historical relics scattered across all regions of the country. This proves that Indonesia is an archipelagic country with many different traditions and cultures in each region. The existence of these historical heritages shows the characteristics of history or history in the past in that area, so the remains in each region may vary, but there are also some similarities because of the history or history that is continuous between one region and another. In this regard, local history, which is widespread in Indonesia, can be utilized as a reference in certain areas [3]. One of them is the city of Madiun, which holds many historical relics from ancient times.

The city of Madiun is one of the cities in East Java that has many heritage buildings from the Dutch Colonial Era that have unique colonial architecture, such as government buildings, churches, and old houses. This architecture often shares characteristics with European architectural styles of the time, such as the use of columns, ornaments, and conspicuous facades. From a historical point of view, the city of Madiun used to be known as a shopping center and was used as one of the important icons set by the government at that time, so people carried out a lot of trade mobility in the area. This caused urban infrastructure, such as roads, bridges, waterways, and train stations, to be built and expanded by the Dutch colonial government during its time, of which there are still some relics that are still functioning. Along with the development of the economic sector at that time and supported by the area of the city of Madiun, it had an influence on the architecture of the building, which had an impact on the visual character of contemporary Dutch architectural buildings with a blend of architectural elements from the regional traditions of the city of Madiun in the colonial era [4]. Apart from that, the city of Madiun also keeps a historical cultural heritage; for example, the influence of Dutch culture may still be found in culinary traditions, language, clothing, or certain celebrations in the city of Madiun. This legacy can reflect the interaction and cultural mix between the local population and the Dutch colonial government. In this case, the City of Madiun has the potential to become a strategic socio-cultural tourism area with many heritage buildings from the colonial era [5].

Madiun is a historic city with various events during the colonialism era that left historical traces in the form of historic buildings and sites that are important to the people of the city itself or the wider community. However, this is still not widely known by the wider community or even the local community itself, so efforts are needed to develop the tourism sector for the City of Madiun based on augmented reality technology to improve the economy of the local community and introduce the social culture and historical heritage of the Kota Tua Madiun. With no system used to read map information in the Kota Tua Madiun area, which holds many historical relics from the Dutch colonial era, it is felt necessary to be able to map the Kota Tua Madiun based on augmented reality. Mapping the area based on AR, or augmented reality, aims to make it easier for people to read information and be able to recognize various kinds of historical relics in several areas of the Kota Tua Madiun [6]. In addition, it can also be an interactive educational tool. Tourists can access additional information in the form of text, images, or videos that explain the context of historic buildings on the tours they visit. This can increase the understanding of tourists or application users about cultural heritage, increase interest in history, and promote social culture and historical heritage that can be accessible to all members of society.

2. Method

The method used in this research is library research, which is a method of collecting data from various sources of literature that are relevant to the research. Pringgar & Sujatmik (2020) stated that this study has a uniqueness that is used as a basis for developing research knowledge, including research dealing directly with the data or text presented. Researchers directly only deal with sources that are already in the library or data that is ready to be used, as well as secondary data. Providing new theories supported by appropriate data collection

techniques is a form of literature review [7]. In this study, data collection techniques used secondary data, namely collecting data indirectly by examining the object in question. The use of augmented reality-based learning models requires the use of secondary data [8]. Library materials obtained from various references are critically and thoroughly analyzed to support the author's new ideas about the phenomena that occur.

The stages in this library method begin with selecting clear and relevant topics regarding the development of digital urban tourism applications, then exploring information that is correlated with mapping urban areas in the development of AR (Augmented reality) applications, then determining the research focus and collecting relevant data sources. research by using ways to find sources and construct from various sources, for example, books, journals, and research that has been done, as well as preparing for data presentation [9]. The results of this method are then analyzed critically and in depth to support the proportions and ideas using descriptive methods.

3. Discussion

Tourism is one of the leading sectors of the national economy and can increase the country's foreign exchange earnings to carry out national development. Prabhawati (2019) states that by taking advantage of the cultural diversity that exists in Indonesia, the cultural tourism industry plays an important role because it has significant cultural and economic values that complement one another in supporting the country's foreign exchange earnings[10]. Thus, the important role of government collaboration with the community is needed to maintain the preservation of cultural and historical heritage. Governments have a role in formulating policies, regulating legal protections, and providing resources for the maintenance and restoration of cultural heritage. Meanwhile, the community has local knowledge, active involvement, and concern for their cultural heritage. Entering a more advanced era of digitalization provides great opportunities that can be put to good use through the correct and effective use of technology, such as digital urban tourism applications based on AR or Augmented reality, to develop the cultural tourism industry sector and overcome historical and cultural existences that are declining over time.

The digital urban tourism application is a digital technology media based on Augmented Reality that contains information on the remains of historic buildings in the City of Madiun. This application supports the development of creative industries in the tourism sector by utilizing currently developing technologies. The features available in the Augmented Reality application are in the form of scanning a QR code, which has a concise, attractive, and easy-to-use design. The QR code is contained in the application to display a visual 3-dimensional object of the building, which is complemented by a description of the history of the building accompanied by audio or sound to display information in a clear and real [11]. In addition, this audio or sound feature can make it easier for tourist visitors who have visual limitations to find out complete and clear building description information through the sound generated from the application. Based on several studies, it is stated that the number of internet users in the world is increasing rapidly every year, causing conventional reading interest to decline because the current generation of children is more concerned with the information conveyed through their

smartphones. This behavior makes the current generation prefer real information with attractive pictures and visuals, compared to conventional media, which are less interactive to learn. So that the current technology is developed to keep up with the rapid development of technology into an Augmented Reality-based application that can be used on all platforms and is available on smartphones.

The digital urban tourism application makes it easy to use because there is a location feature to show historical buildings that are mapped to several locations in the Kota Tua Madiun area. Mapping areas in the City of Madiun that have heritage buildings can help local people see the potential of their area and, at the same time, make residents informants for future visitors and tourists. Thus, it is hoped that the community can become an actor and play an active role in industrial development. creatively through tourism in Kota Tua Madiun and developing the potential of the local area. The features contained in the digital urban tourism application allow users to obtain general information, location, distance, and route to that location. In addition, the public and tourists can enjoy a real visualization of historical buildings in the city of Madiun, which has unique details of contemporary Dutch architectural buildings with a blend of architectural elements from the regional traditions of the city of Madiun. The urban tourism digital application is also equipped with markers in the form of unique icons for each map of the Kota Tua Madiun tourist area to make it easier for local and foreign tourists to recognize the historical heritage found in the area. In addition, this application can also be used by users by downloading the digital urban tourism application to explore the Kota Tua area virtually.

With Augmented Reality, this application can be developed into a more effective and interactive educational application through the quality of its visualization to provide new knowledge and conceptual understanding of the history of buildings during the Dutch colonial era in Madiun City, where previously learning was taught in an abstract and monotonous manner [12]. In addition, with the help of digital applications urban tourism can support historical education facilities in Madiun City by combining educational and entertainment methods to create new methods to support formal and informal learning and teaching. With the help of augmented reality, educators need visualization so that it helps in the learning activities of students who interact with systems that can store more information compared to learning that still uses conventional methods. In fact, according to research conducted by Sadirman (2017), learning history is simply memorizing concepts and understandings, which results in learning history being uninteresting and students becoming burdened and bored, so that interest in learning history decreases [13]. However, this can be overcome by using a digital urban tourism application that makes it easy to access historical tourist attractions virtually or online, which can save time, distance, and costs. So that visitors have an interesting experience because it is equipped with facilities such as digital urban tourism applications that provide complete and interactive information about interesting facts and the origins of historic buildings in the Kota Tua Madiun.

In the era of the Industrial Revolution 4.0, information technology plays an important role in the success of a business and in human life [14]. The more developed the age of human knowledge, the more literate today's information technology will be. This digital transformation is a breakthrough in targeting the industrial market, which is an excellent opportunity

considering that today's people's behavior is inseparable from the use of digital technology in their daily activities. Likewise, the tourism industry is inseparable from the role of information technology in the use of Augmented Reality applications as an alternative promotion that can be widely spread compared to conventional promotional media to increase local and foreign tourist visits to tourist destinations in the Kota Tua Madiun. So far, tourist attractions have only used conventional promotional media based on writing and pictures that can be seen from one side, which is less effective at attracting tourists who find it difficult to imagine the original form of the heritage building and its unique architecture. Therefore, a real-time picture is needed that will make it easier to visualize historical building forms and architectural designs, namely Augmented Reality (AR). In addition, in the tourism sector, Augmented reality, or AR technology can be used to provide interactive tourism guides to visitors. By using the AR application on their device, visitors can see signs, instructions, and additional information that appears in the real world through the screen of their device or smartphone. This allows visitors to explore historical attractions in Kota Tua Madiun more easily and get a complete explanation of the objects and locations they visit.

Promotional media using augmented reality technology can increase the number of tourists through an interactive visualization experience exploring historical buildings in depth so that they can attract tourists to visit the Kota Tua Madiun in real terms. By integrating various information and tourist attractions in the City of Madiun through the digital urban tourism application based on augmented reality, it can make it easier for tourists to make travel plans on their favorites list to increase income for the people and government of the City of Madiun through taxes [15]. Here, the government's role is needed to provide the best facilities to tourists, such as access road infrastructure to tourist attractions and adequate public facilities. Not only that, socialization is needed for the development and training of creative industries to utilize the tourism culture to support the welfare and economic prosperity of the local community. In addition, the use of AR, or Augmented Reality, technology in tourism promotion media can enrich the competitiveness of other tourism destinations, which can provide a competitive advantage for a destination. Destinations that can present interesting and innovative experiences through Augmented Reality can attract more tourists and differentiate themselves from other destinations. This can contribute to the growth of cultural tourism and sustainable economic development.

The features contained in the application are intended as a means of marketing media and marketing the application so that the number of application users increases and the dissemination of information is widespread, causing users to be motivated to spend more on their budgets at the Kota Tua Madiun tourist destination. In addition, tourism marketing through promotions using digital and social media can achieve marketing objectives at relatively low costs [16]. With the development of Kota Tua Madiun tourism, it can create new jobs for local people and increase local people's income directly or indirectly because tourists who come to these historical tourist destinations will spend money on accommodation, food, transportation, and various other local services, thus leading to an increase in the regional economy.

4. Conclusion

The use of augmented reality, or AR-based applications, has the potential to be used in the process of mapping areas containing historic buildings from the Dutch colonial era as a promotional medium for the development of historical tourism in several areas of the Kota Tua Madiun. This is an innovative solution in the era of the Industrial Revolution 4.0, which uses a lot of information technology as a promotional medium to reduce the use of print media, which is less effective in conveying information. Through the facilities contained in the application, it provides an interactive experience for visitors because the presentation of real visualizations of historical buildings is accompanied by complete and interesting information from applications based on augmented reality.

Promotional media using augmented reality technology provides effectiveness in increasing the accessibility and attractiveness of tourists to the Kota Tua Madiun. With the help of 3D visualization, the display of historical buildings in real-time provides an interactive experience that can attract tourists to enjoy the real city buildings of the Kota Tua Madiun. This can increase people's income by forming more and more umkm around historical areas and causing regional income to increase.

The hope is that through this augmented reality application, you can experience development and updates on the features available in line with the development of digital technology today. So that it can continue to be used to develop areas that have cultural potential and are rich in historical relics. Thus, the community will become more literate about the cultural history around them and remain sustainable.

References

[1]   Yuniasih, S., Setyowardany, D. P., Iswantari, R. E., & Khasanah, L. S. (2022). Monumen Kresek Tempat Wisata Penuh Sejarah. *Jurnal Sastra, Bahasa, dan Budaya (Sabaya)*, *1*(1), 23-29.

[2]   Soraya, A. (2018). Perancangan augmented reality sebagai media promosi pada museum negeri Sumatera Utara. *PROPORSI: Jurnal Desain, Multimedia dan Industri Kreatif*, *4*(1), 13-25.

[3]   Syahputra, M. A. D., Sariyatun, S., & Ardianto, D. T. (2020). Peranan penting sejarah lokal sebagai objek pembelajaran untuk membangun kesadaran sejarah Siswa. *Historia: Jurnal Pendidik dan Peneliti Sejarah*, *4*(1), 85-94.

[4]   Sukarno, P. G. (2014). Karakter Visual Fasade Bangunan Kolonial Belanda Rumah Dinas Bakorwil Kota Madiun. *NALARs*, *13*(2).

[5]   Fathoni, B. F. (2017). Arahan pengembangan pariwisata heritage terpadu di kota madiun. *Jurnal Teknik ITS*, 6(2), C285-C289.

[6]   Dimas, D., Nurjayadi, N., & Haryono, D. (2018). Penerapan Augmented Reality Pada Informasi Data Peta Kawasan Hutan Lindung Menggunakan Metode Marker. *Sains dan Teknologi Informasi*, *4*(2), 100-109.

[7]   Pringgar, R. F., & Sujatmiko, B. (2020). Penelitian Kepustakaan (Library Research) Modul Pembelajaran Berbasis Augmented Reality Pada Pembelajaran Siswa. *IT-Edu: Jurnal Information Technology and Education*, *5*(01), 317-329.

[8]   Syawaludin, A., Gunarhadi, G., & Rintayati, P. (2019). Enhancing Elementary School Students' Abstract Reasoning in Science Learning through Augmented Reality-Based Interactive Multimedia. *Jurnal Pendidikan IPA Indonesia*, *8*(2), 288-297.

[9]   Anggraeni, G. I., Mahta, H. N., & Setyaningsih, M. (2022). Peranan Teknologi Internet dalam Membangun Pendidikan Karakter Anak Menjadi Pemimpin Masa Depan. In *Social, Humanities, and Educational Studies (SHES): Conference Series* (Vol. 6, No. 1, pp. 293-298).

[10]   Prabhawati, A. (2019). Upaya Indonesia dalam Meningkatkan Kualitas Pariwisata Budaya Melalui Diplomasi Kebudayaan. *Journal of Tourism and Creativity*, *2*(2).

[11]   Rachmawati, R., Ramadhan, E. R., & Rohmah, A. A. (2018). Aplikasi smart province "Jogja Istimewa": Penyediaan informasi terintegrasi dan pemanfaatannya. *Majalah Geografi Indonesia*, *32*(1), 14-23.

[12]   Riyanto, S., & Kurniawati, I. D. (2018). Rancang bangun website desa kresek-madiun untuk media informasi potensi wisata alam dan kulinier. *Jurnal Sistem Informasi Dan Ilmu Komputer Prima (JUSIKOM PRIMA)*, *1*(2).

[13]   Sardiman, S. (2017). Reformulasi Pembelajaran Sejarah: Sebuah Tantangan. *ISTORIA Jurnal Pendidikan dan Ilmu Sejarah*, *13*(1).

[14]   Hartini, S., & Anglelyn, C. (2019). Virtual reality: aplikasi teknologi untuk peningkatan kunjungan wisatawan. *Journal of Business and Banking*, *9*(2), 215-227.

[15]   Wilion, Y. W., Tandiyani, R., & Thaddeus, J. (2021). Aplikasi "Kopiland": Aktualisasi Industri Pariwisata Kopi Berbasis Mobile Tourism Sebagai Upaya Memanfaatkan Potensi Kopi Di Provinsi Aceh. *Jurnal Ilmiah Penalaran dan Penelitian Mahasiswa*, *5*(2), 218-238.

[16]   Tambunan, E., & Masatip, A. (2020). Konsep Augmented Reality Sebagai Pengembangan Pemasaran Pariwisata dalam Menghadapi New Normal Masa Pandemi Covid-19. *Jurnal Ilmiah Akomodasi Agung*, *7*(2), 1-10.